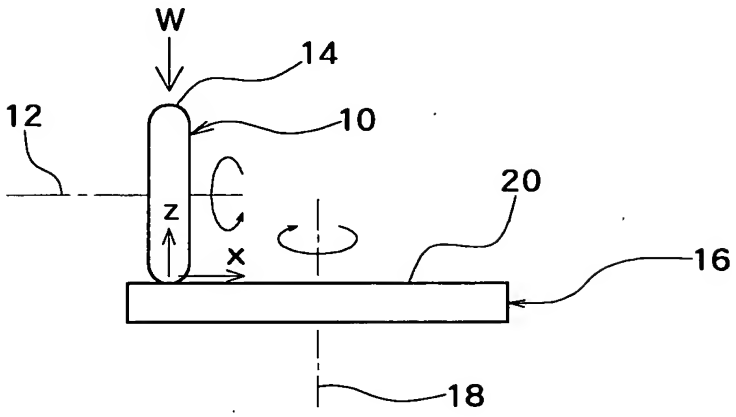


Fig.1

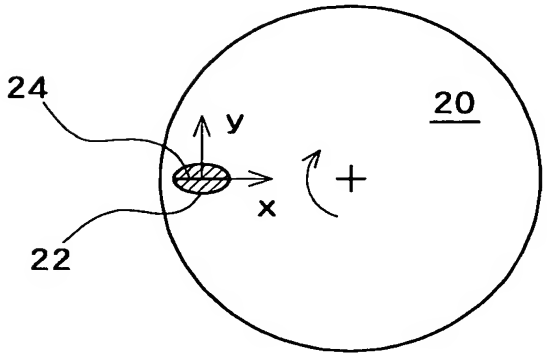


Fig.2

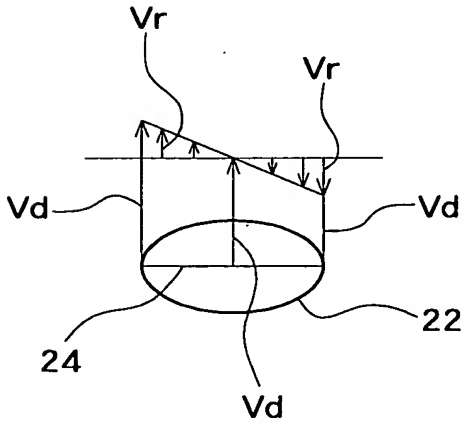


Fig.3

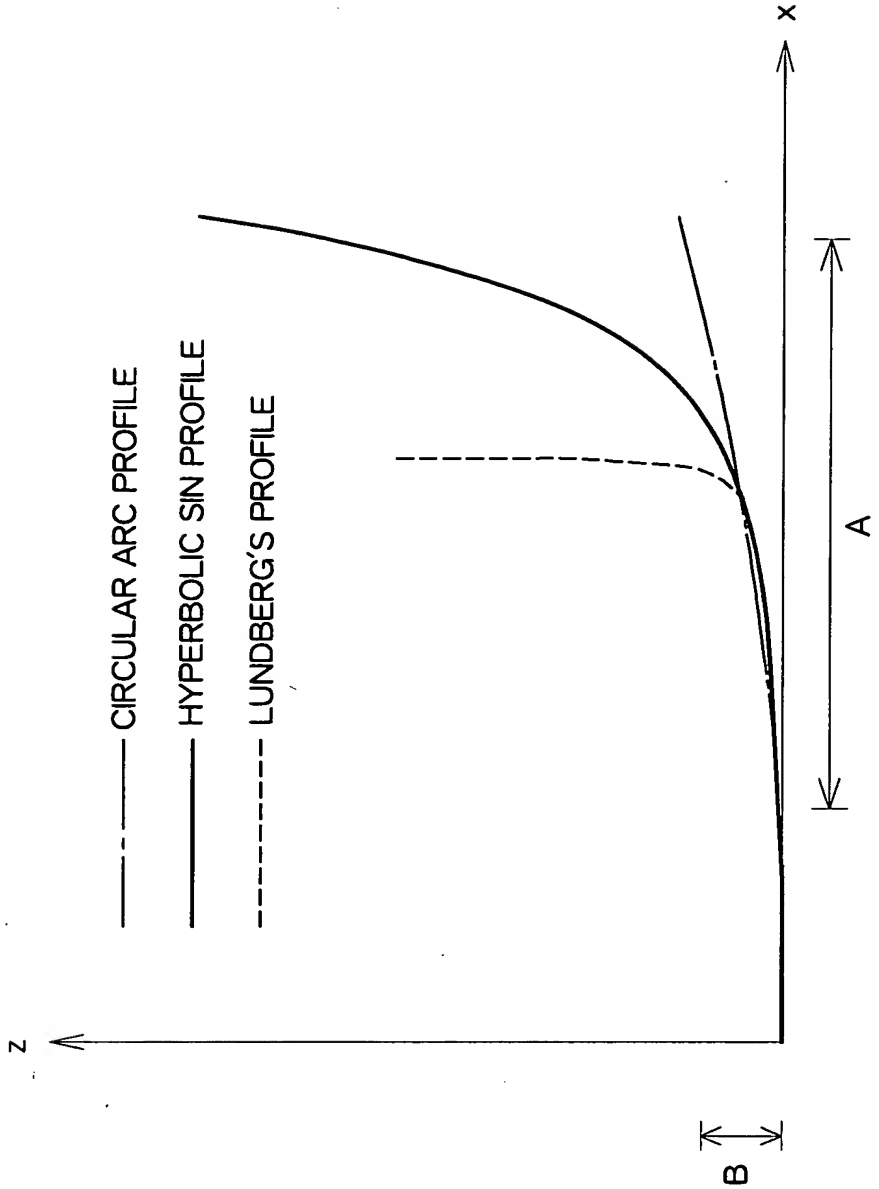

CIRCULAR ARC PROFILE
HYPERBOLIC SIN PROFILE
LUNDBERG'S PROFILE
x
z
A
B

Fig.4

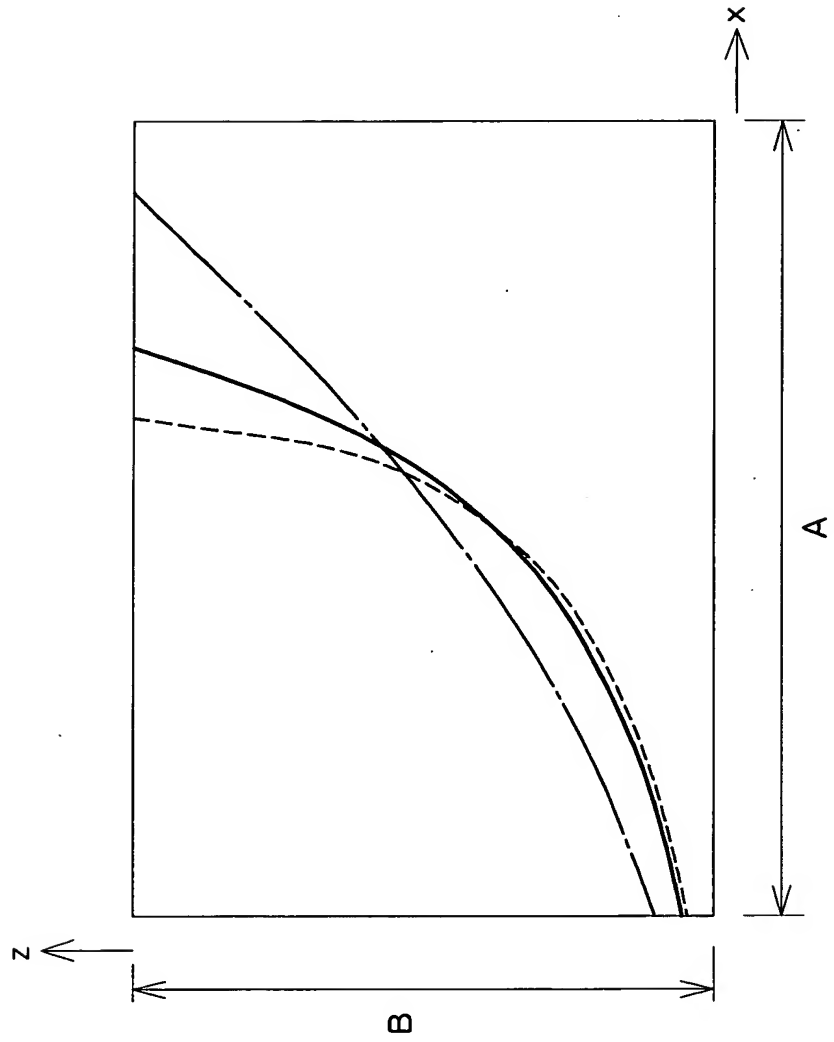


Fig.5

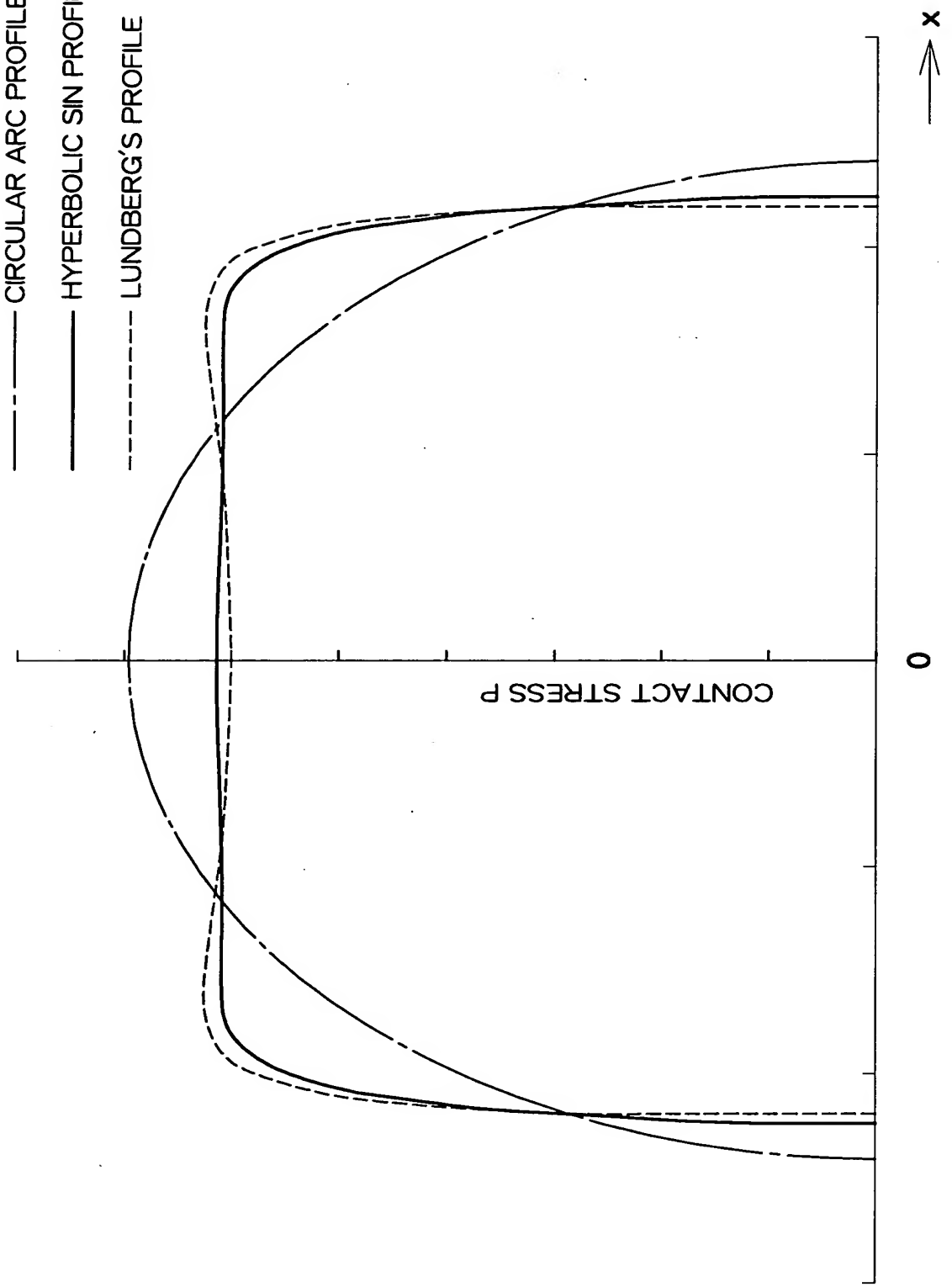


Fig.6

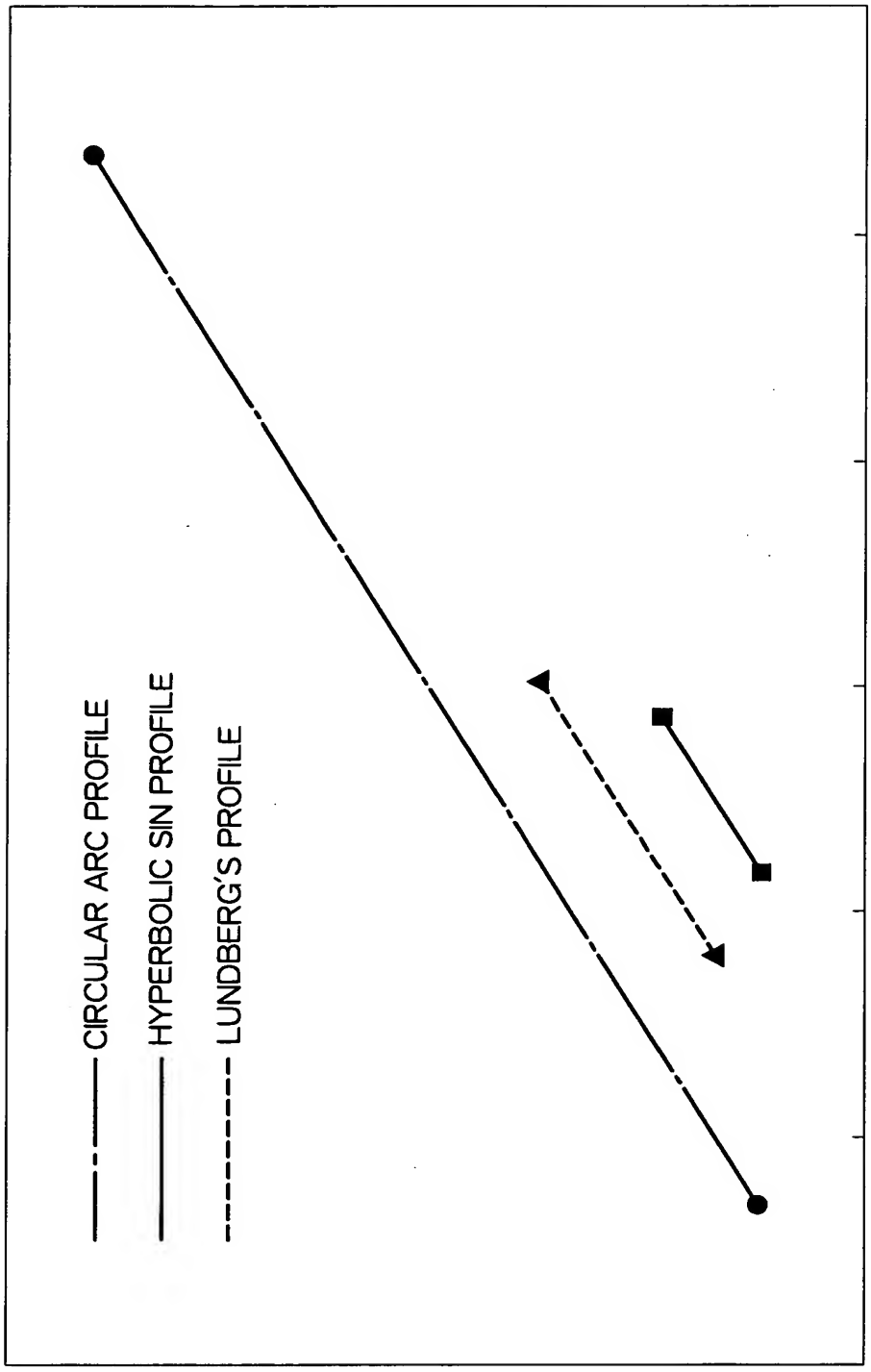


Fig.7

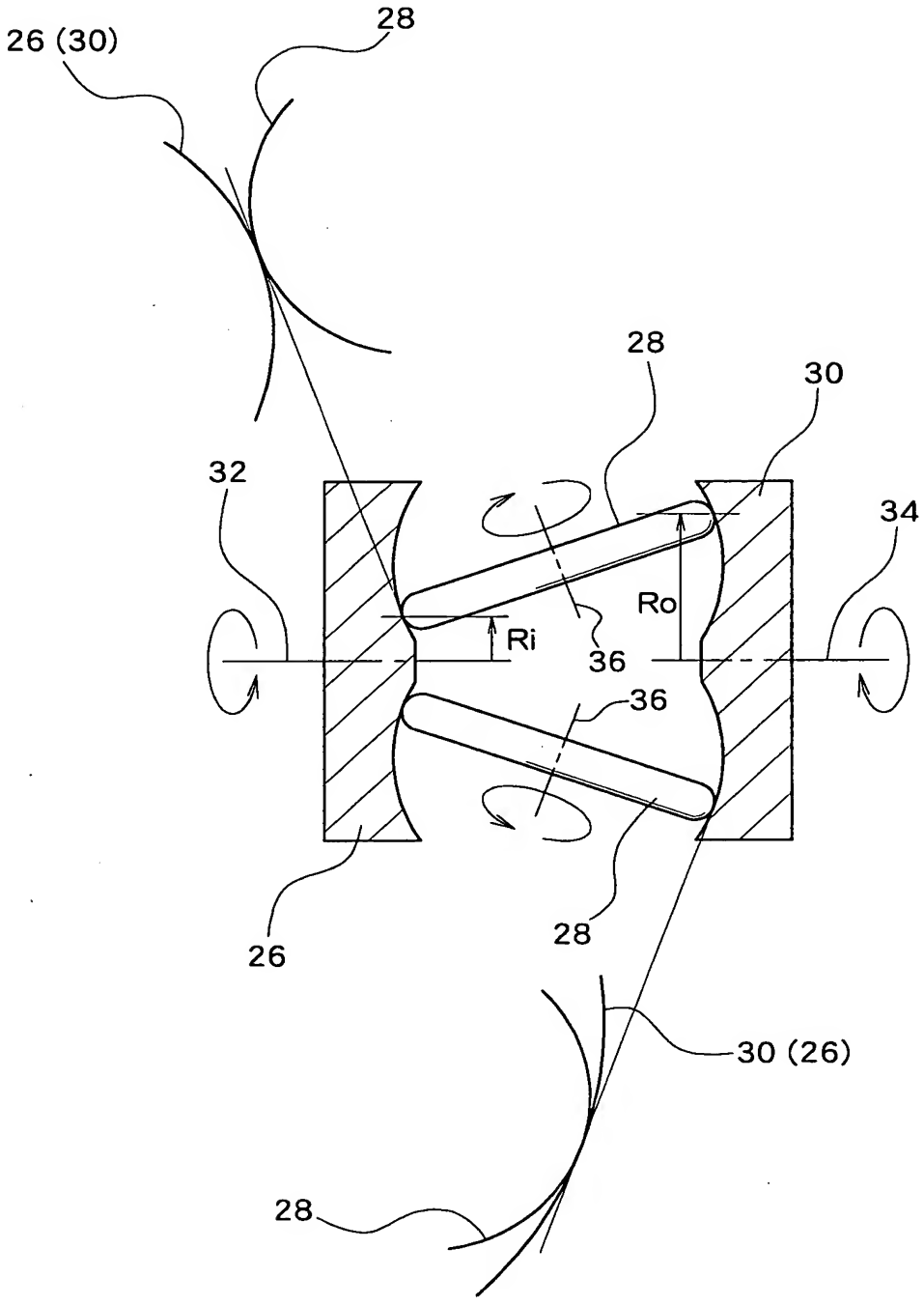


Fig.8

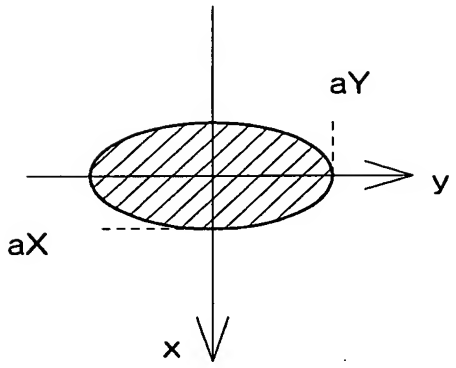


Fig.9

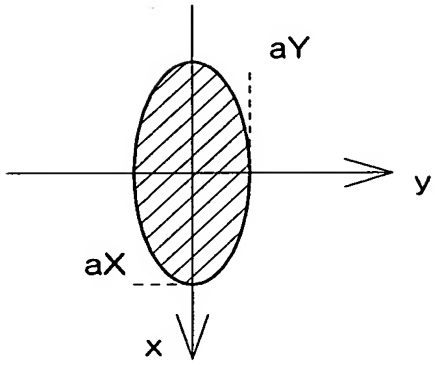


Fig.10

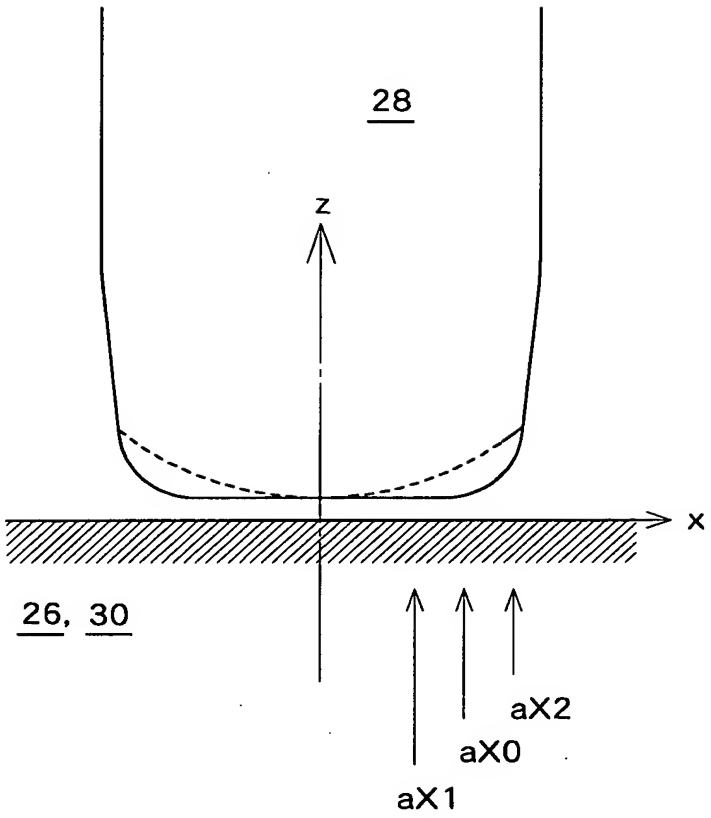


Fig.11

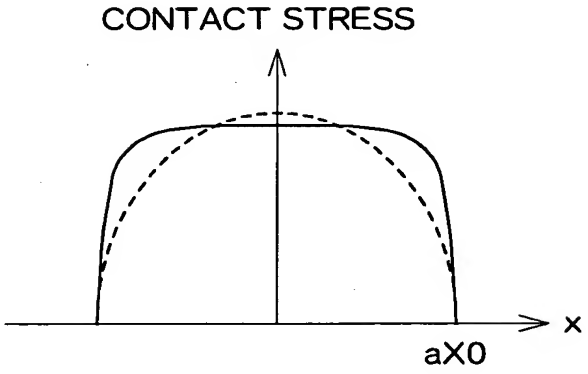


Fig.12

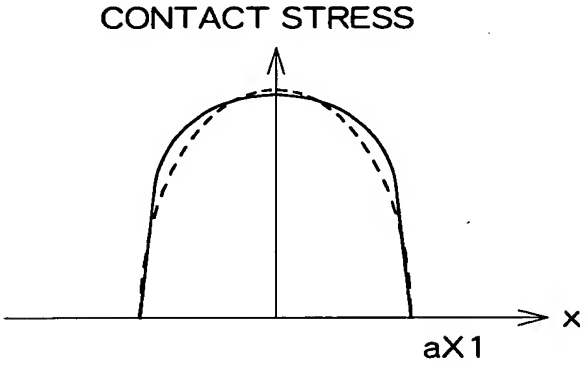


Fig.13

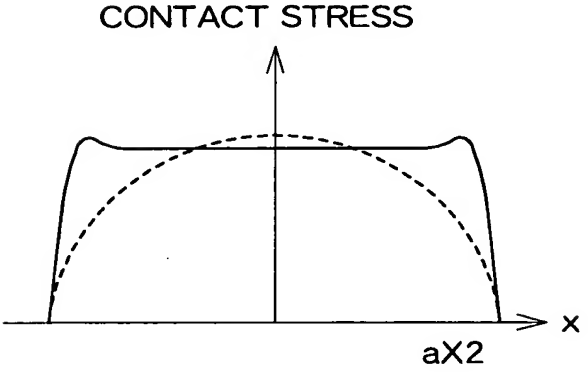
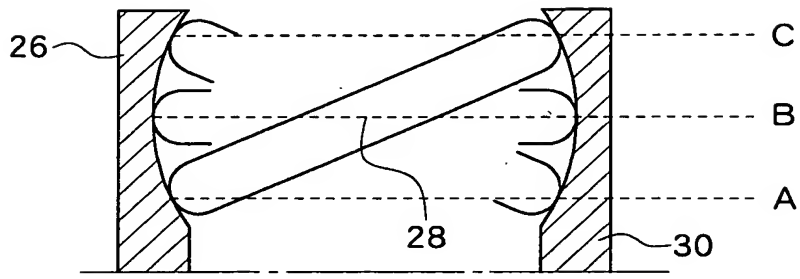


Fig.14



SPEED CHANGING STATE	INPUT CONTACT	OUTPUT CONTACT
DECELERATION	A	C
CONSISTENT SPEED	B	B
ACCELERATION	C	A

Fig.15

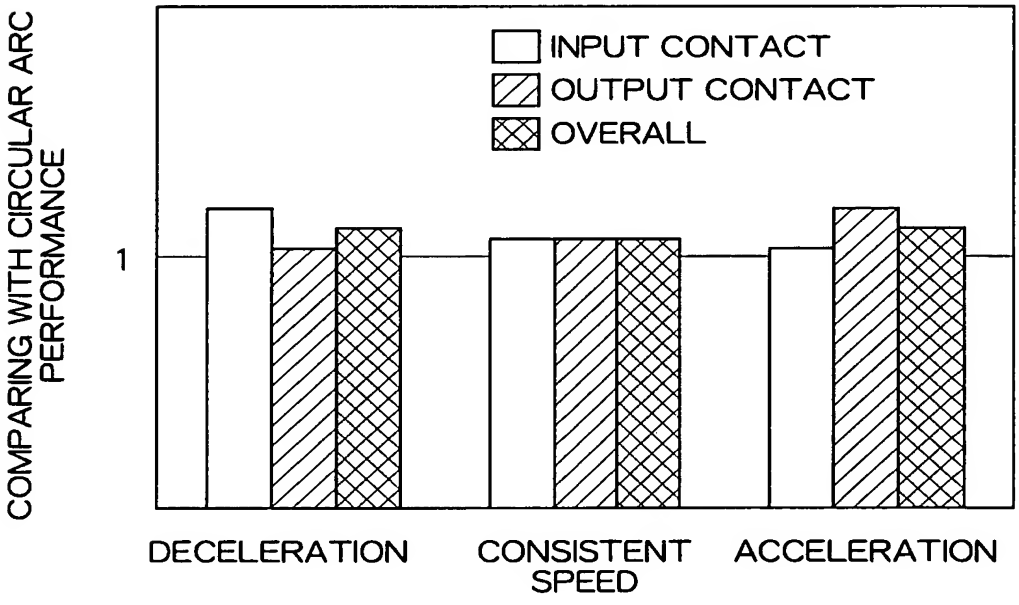


Fig.16

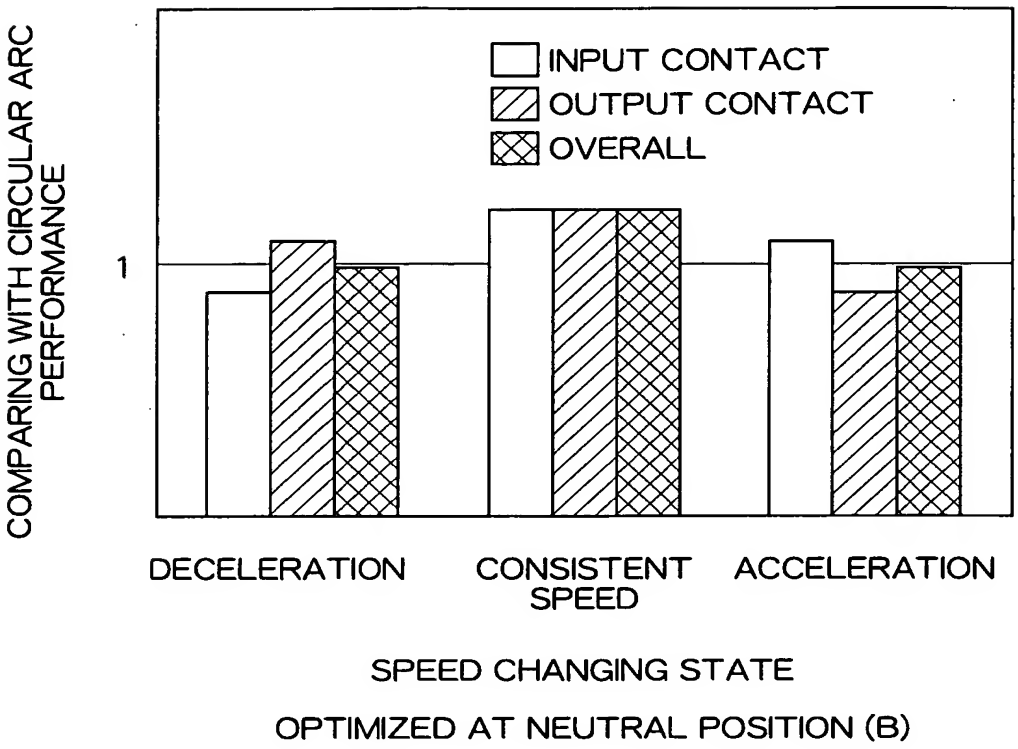

COMPARING WITH CIRCULAR ARC PERFORMANCE
1
INPUT CONTACT
OUTPUT CONTACT
OVERALL
DECELERATION
CONSISTENT SPEED
ACCELERATION
SPEED CHANGING STATE
OPTIMIZED AT NEUTRAL POSITION (B)

Fig. 17

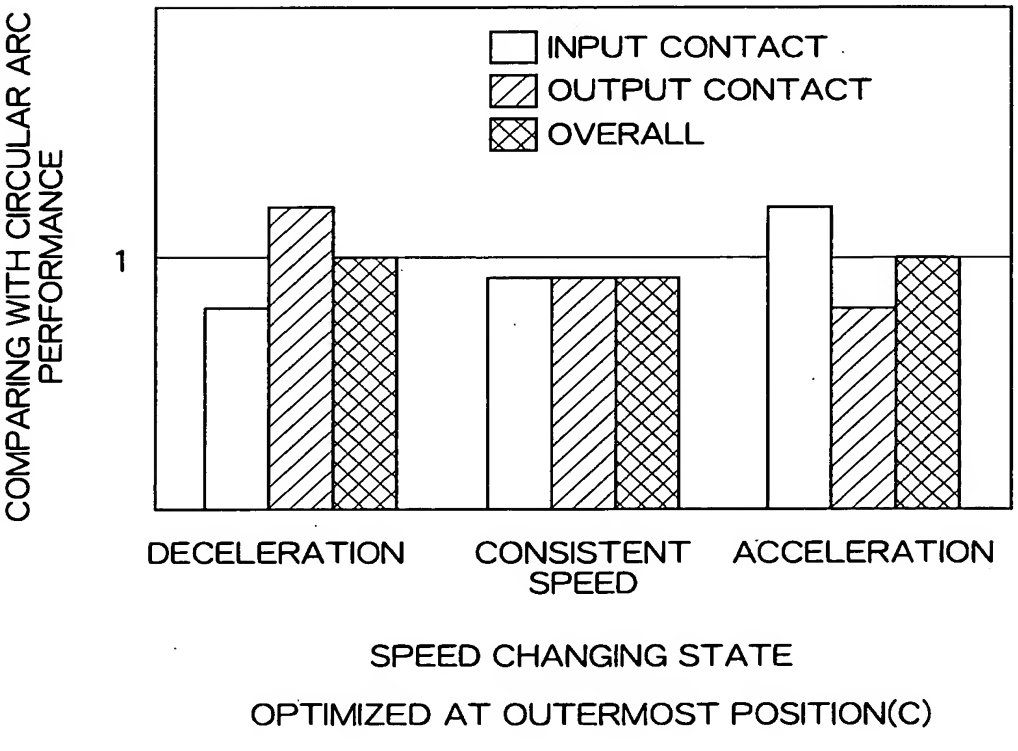

COMPARING WITH CIRCULAR ARC PERFORMANCE
1
INPUT CONTACT
OUTPUT CONTACT
OVERALL
DECELERATION
CONSISTENT SPEED
ACCELERATION
SPEED CHANGING STATE
OPTIMIZED AT OUTERMOST POSITION(C)

Fig. 18

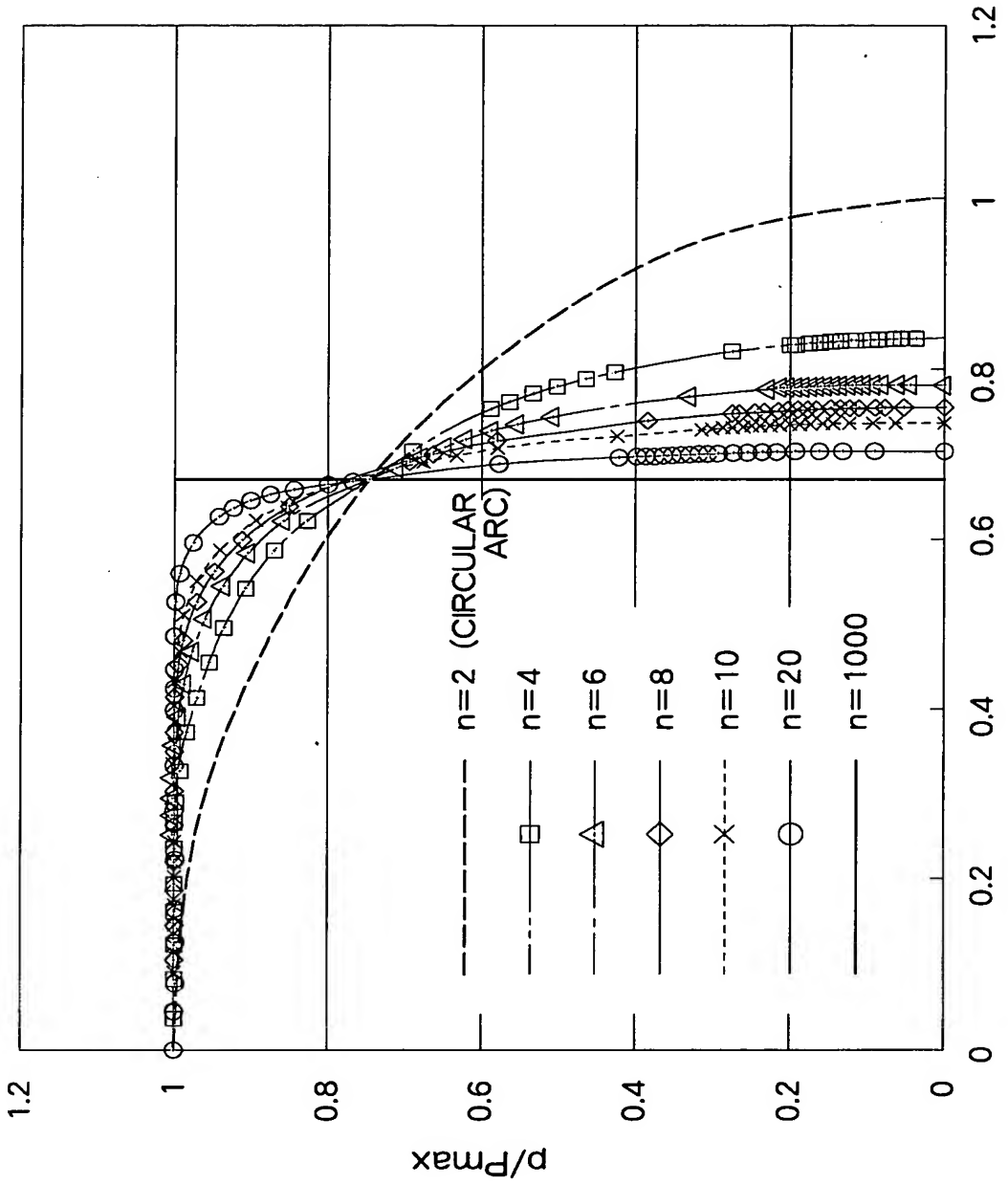

p/Pmax
x/a (CIRCULAR ARC)
n=2 (CIRCULAR ARC)
n=4
n=6
n=8
n=10
n=20
n=1000
0
0.2
0.4
0.6
0.8
1
1.2

Fig.19

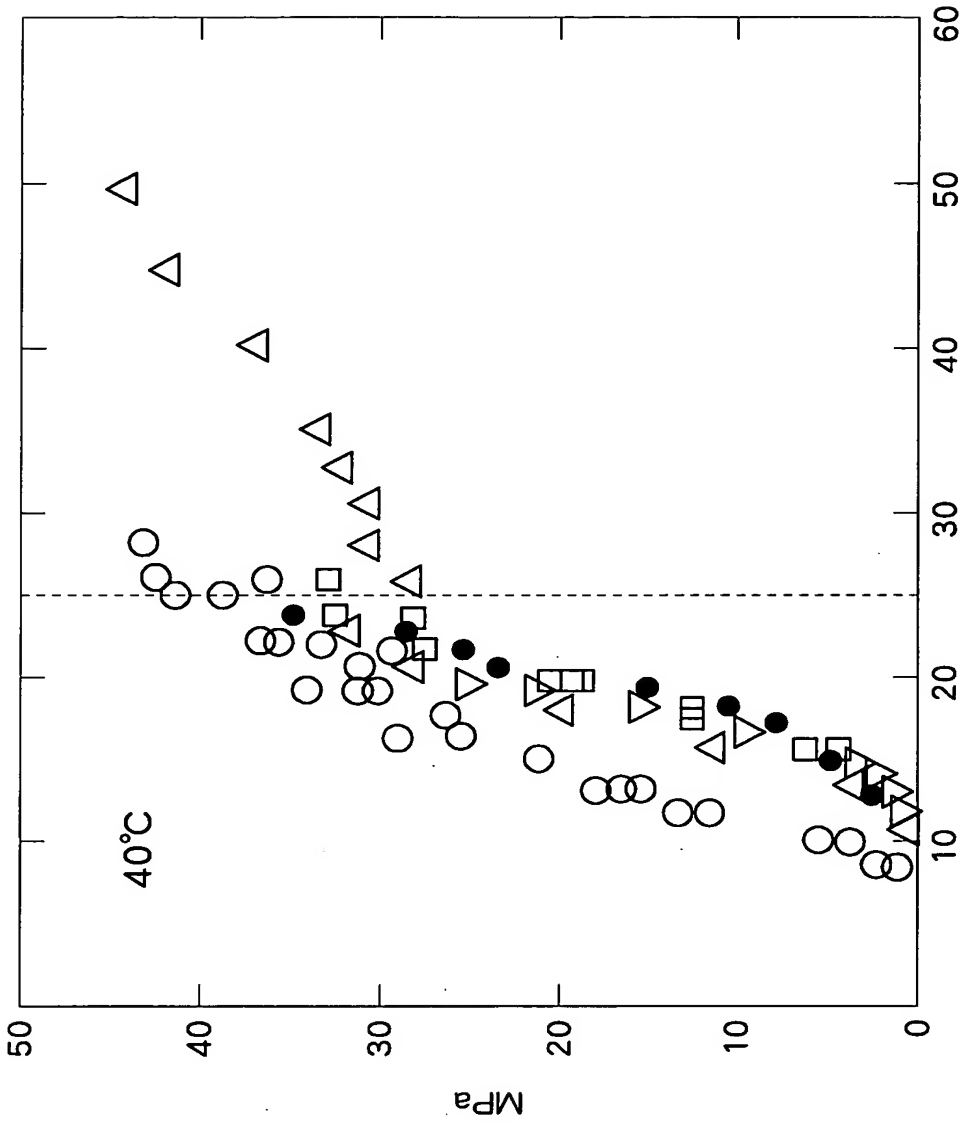


Fig.20

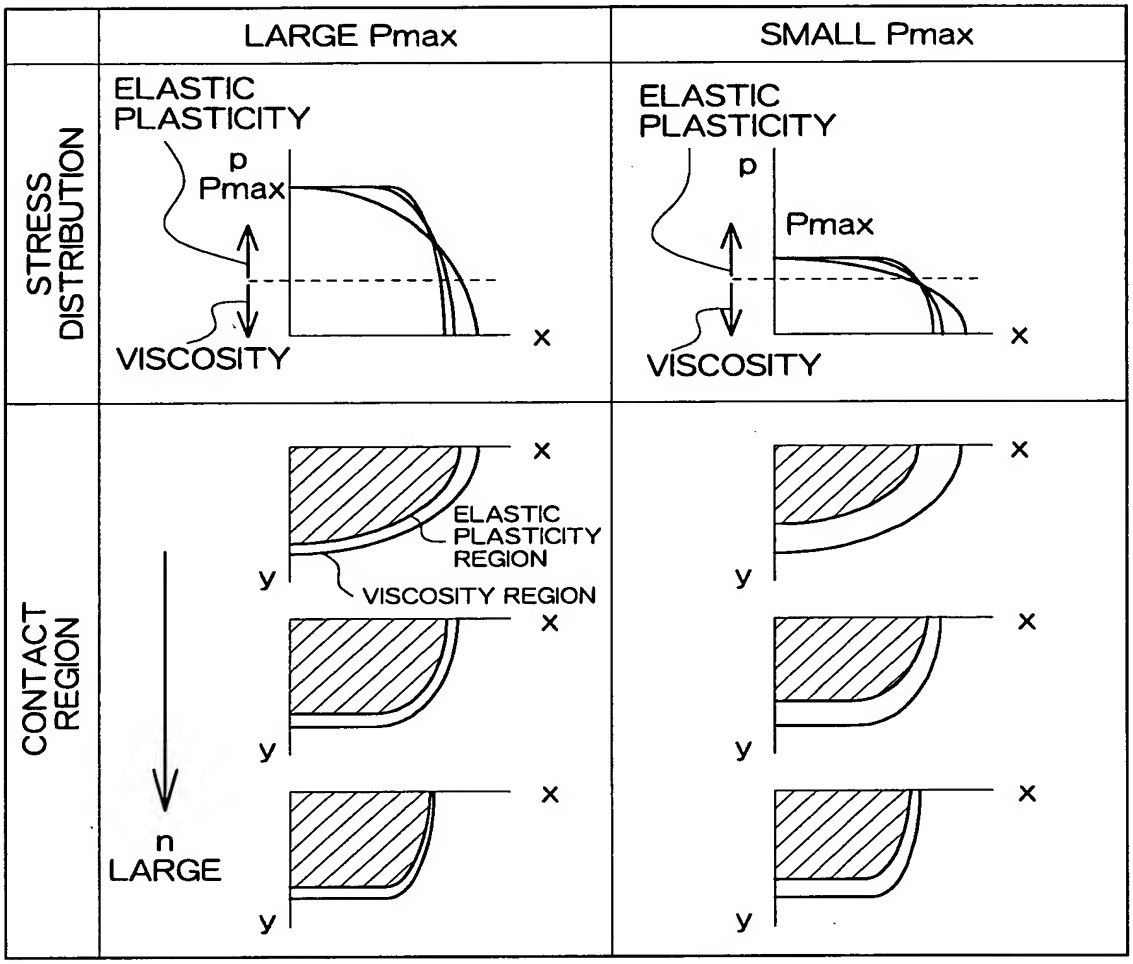

LARGE Pmax
SMALL Pmax
STRESS DISTRIBUTION
ELASTIC PLASTICITY
p
Pmax
VISCOSITY
x
CONTACT REGION
ELASTIC PLASTICITY REGION
VISCOSITY REGION
y
n LARGE

Fig.21

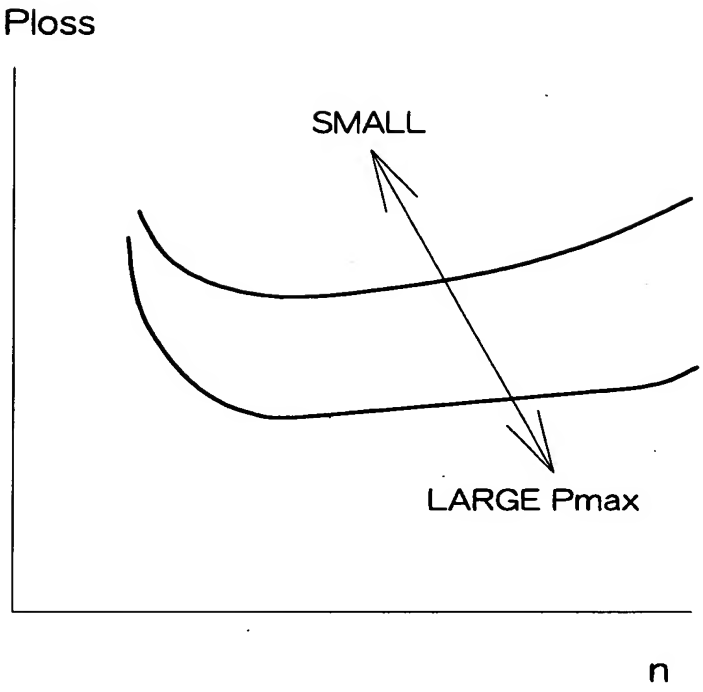


Fig.22

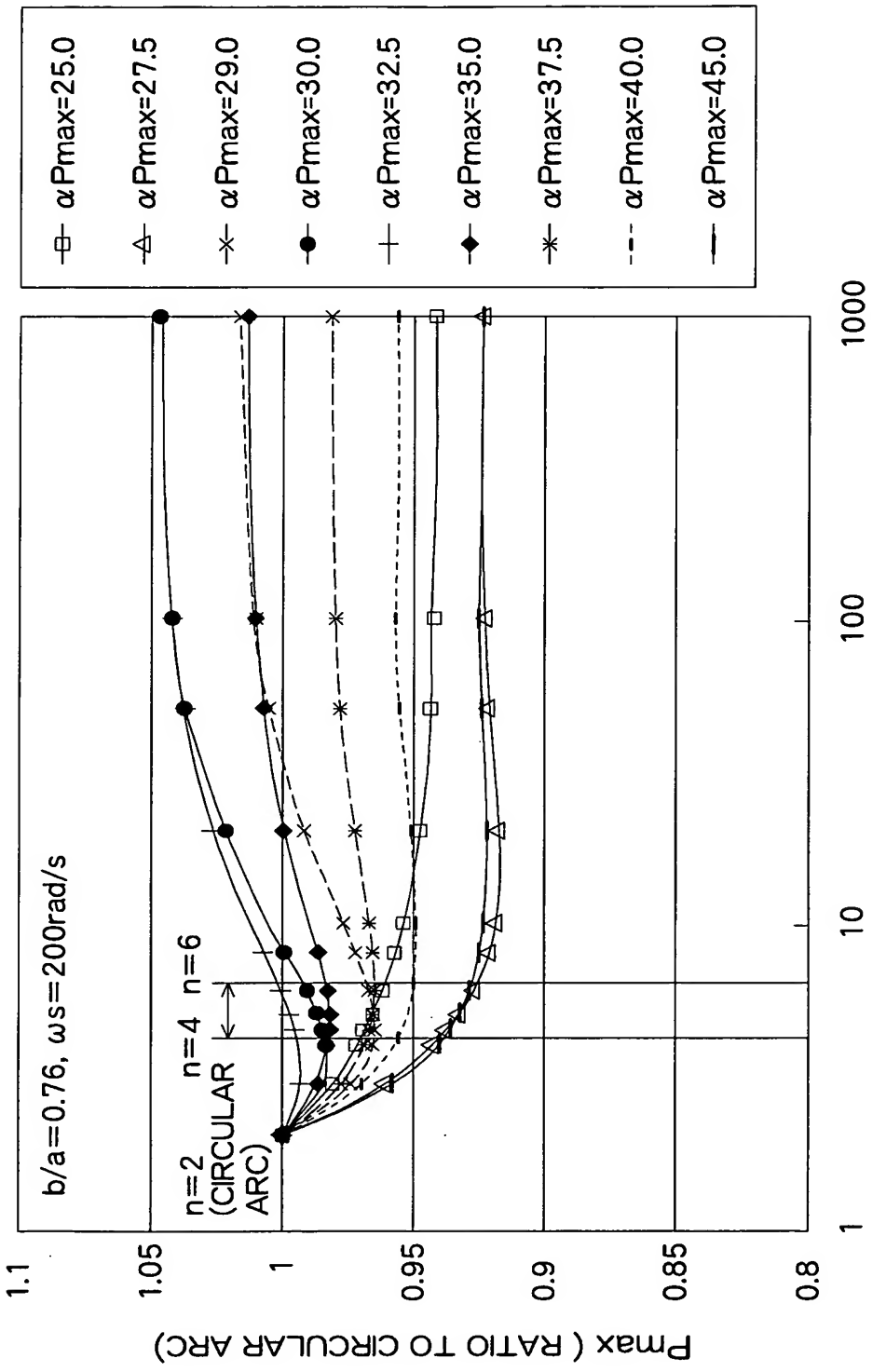

αPmax=25.0
αPmax=27.5
αPmax=29.0
αPmax=30.0
αPmax=32.5
αPmax=35.0
αPmax=37.5
αPmax=40.0
αPmax=45.0
b/a=0.76, ωs=200rad/s
n=2 (CIRCULAR ARC)
n=4
n=6
Pmax (RATIO TO CIRCULAR ARC)
1.1
1.05
1
0.95
0.9
0.85
0.8
1
10
100
1000
n

Fig.23

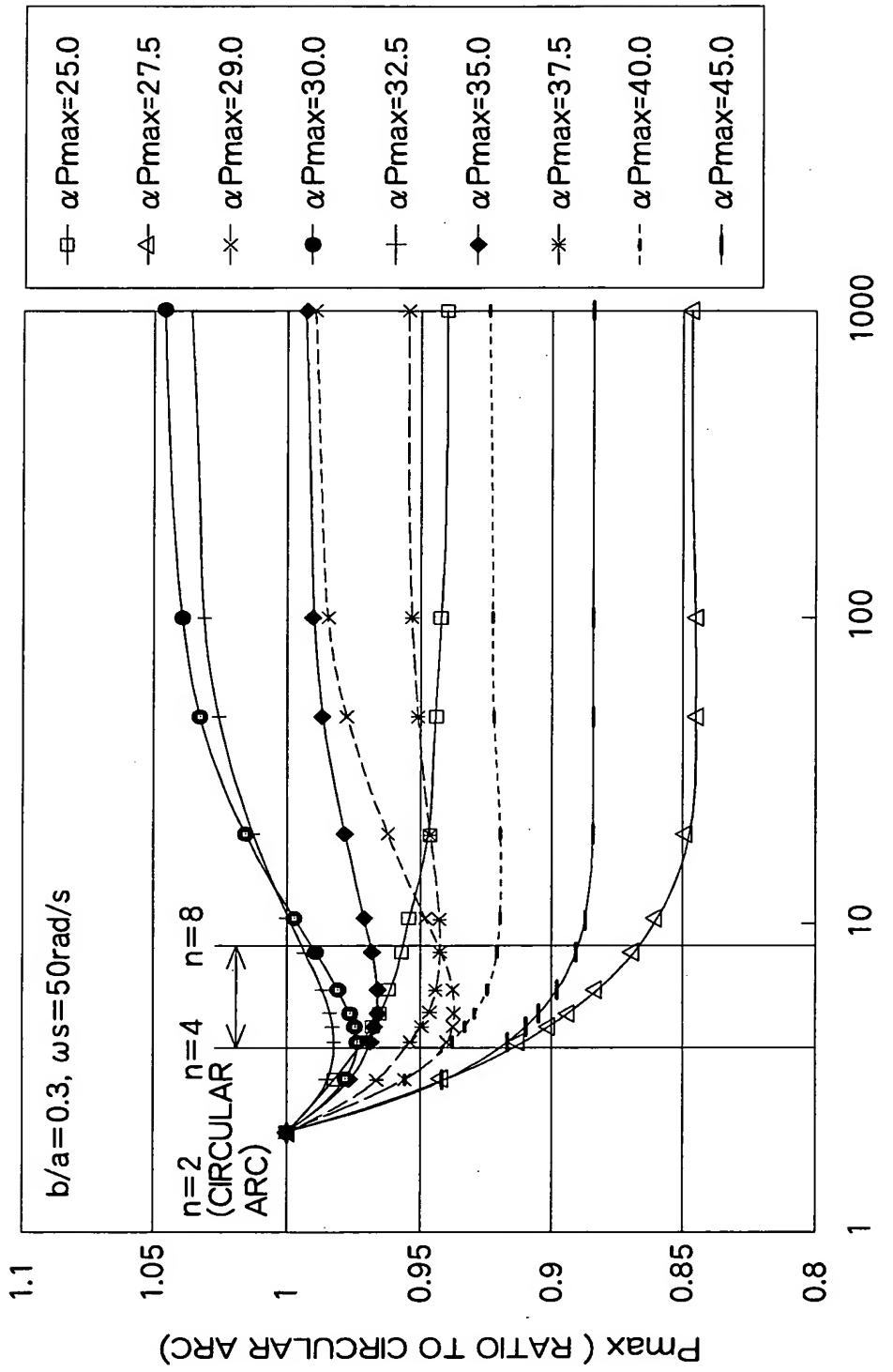

αPmax=25.0
αPmax=27.5
αPmax=29.0
αPmax=30.0
αPmax=32.5
αPmax=35.0
αPmax=37.5
αPmax=40.0
αPmax=45.0
b/a=0.3, ωs=50rad/s
n=2 (CIRCULAR ARC)
n=4
n=8
Pmax (RATIO TO CIRCULAR ARC)
1.1
1.05
1
0.95
0.9
0.85
0.8
1
10
100
1000
n

Fig.24

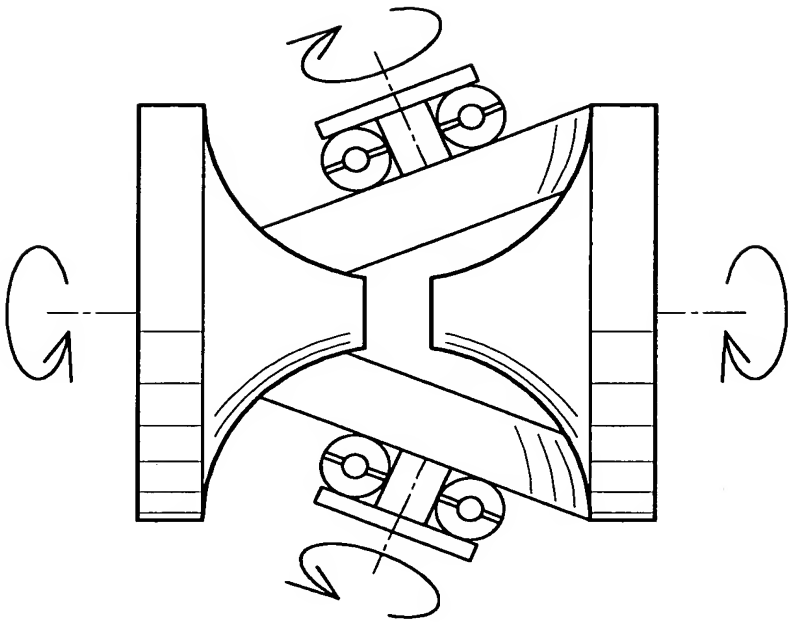


Fig.25

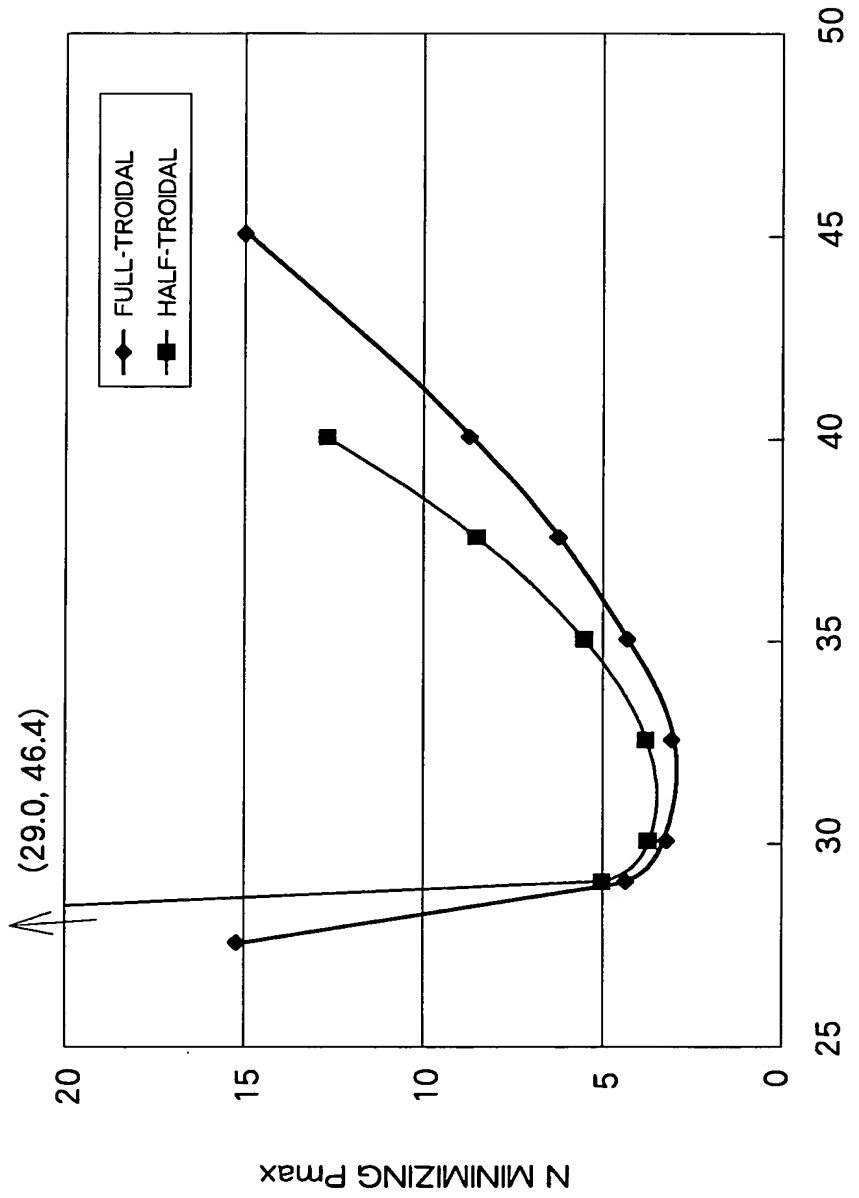

FULL-TROIDAL
HALF-TROIDAL
(29.0, 46.4)
N MINIMIZING Pmax
αPmax
0
5
10
15
20
25
30
35
40
45
50

Fig.26

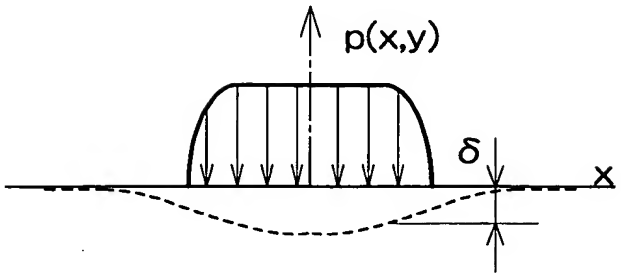


Fig.27A

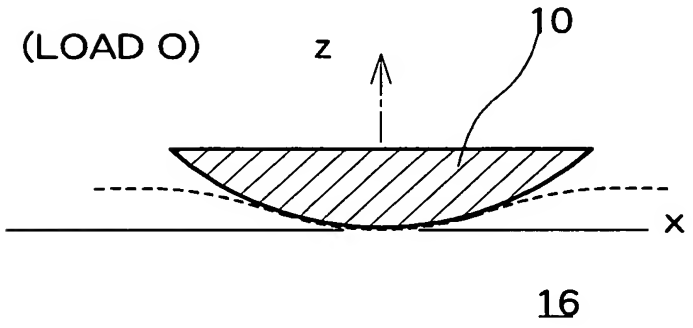


Fig.27B

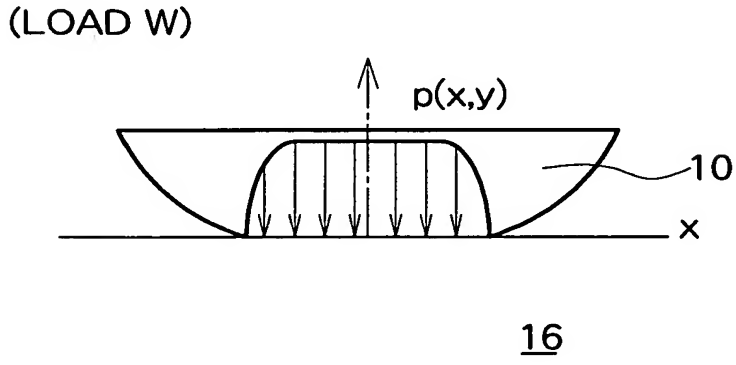


Fig.27C

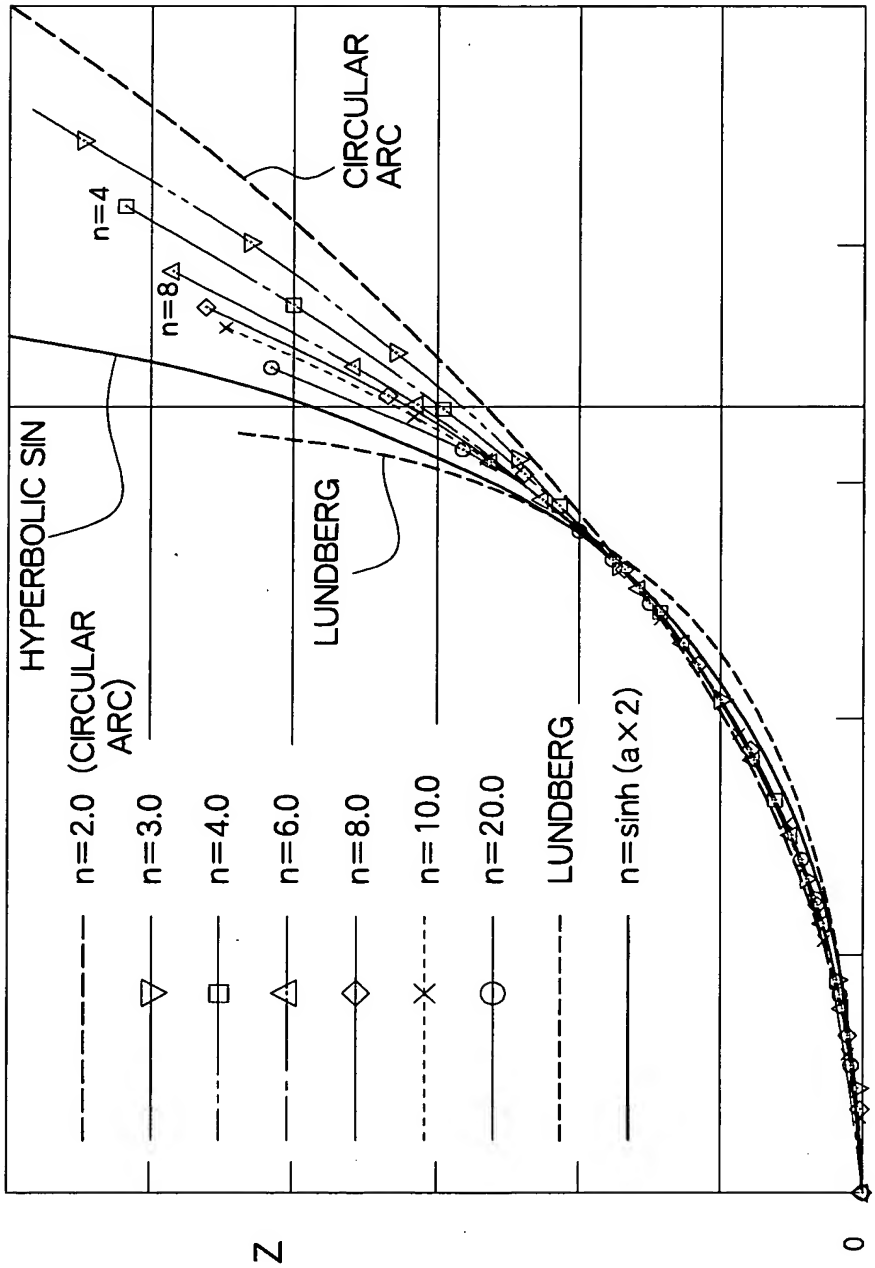

HYPERBOLIC SIN
n=2.0 (CIRCULAR ARC)
n=3.0
n=4.0
n=6.0
n=8.0
n=10.0
n=20.0
LUNDBERG
n=sinh (a×2)
CIRCULAR ARC
LUNDBERG
n=4
n=8
Z
X
0
0

Fig.28